

CLAIMS

1. A method of preventing or delaying the onset of a disease having the characteristics of type 1 diabetes or of ameliorating an early stage thereof in a mammal at risk of developing said disease which method comprises administering to said mammal an effective amount of a hormonally inactive insulin or insulin analogue.
2. The method of claim 1 wherein the mammal is a human being.
3. The method of claim 1 wherein the *in vitro* activity of the insulin or insulin analogue is less than 7% of the activity of human insulin.
4. The method of claim 1 wherein the insulin analogue is selected from the group comprising:
- desA1 human insulin;
 - des(A1-A2) human insulin;
 - des(A1-A3) human insulin;
 - desA21 human insulin;
 - des(B1-B5) human insulin;
 - des(B1-B6) human insulin;
 - des(B23-B30) human insulin;
 - des(B24-B30) human insulin;
 - des(B25-B30) human insulin;
 - Gly^{A2} human insulin;
 - Ala^{A2} human insulin;
 - Nle^{A2} human insulin;
 - Thr^{A2} human insulin;
 - Pro^{A2} human insulin;
 - D-allo Ile^{A2} human insulin;
 - Nva^{A3} human insulin;
 - Nle^{A3} human insulin;
 - Leu^{A3} human insulin;
 - Val^{A2}, Ile^{A3} human insulin;

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- Abu^{A2}, Abu^{A3} human insulin;
 Gly^{A2}, Gly^{A3} human insulin;
 D-Cys^{A6} human insulin;
 D-Cys^{A6}, D-Cys^{A11} human insulin;
 5 Ser^{A6}, Ser^{A11}, des(A8-A10) human insulin;
 D-Cys^{A7} human insulin;
 D-Cys^{A11} human insulin;
 Leu^{A19} human insulin;
 Gly^{B6} human insulin;
 10 Glu^{B12} human insulin;
 Asn^{B12} human insulin;
 Phe^{B12} human insulin;
 D-Ala^{B12} human insulin; and
 Asp^{B25} human insulin.
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5. The method of claim 4, wherein the insulin analogue is
 Asp^{B25} human insulin.
- 20 6. A pharmaceutical composition for preventing or delaying
 the onset of a disease having the characteristics of type 1
 diabetes or for ameliorating an early stage thereof in a
 mammal at risk of developing said disease which composition
 comprises an effective amount of a hormonally inactive
 insulin or insulin analogue according to any one of the
 25 claims 1 and 2 to 5.
- 30 7. Use of an insulin or an insulin analogue according to any
 one of the claims 1 and 2 to 5 for producing a
 pharmaceutical composition for preventing or delaying the
 onset of a disease having the characteristics of type 1
 diabetes or for ameliorating an early stage thereof in a
 mammal at risk of developing said disease.

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A2
 A3
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 B1